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Particles and Fields— Magnetosphere

5129 Interaction between solar wind and magnetosphere: CHARACTERISTICS OF STORM SIDDEN CONCERNMENT AT GEOSTATIONARY ORBIT
Suzuma Kokubo (Geophysical Research Laboratory, University of Tokyo), 113 pp., \$15.00.

Eighty-nine substorms (concernments) were observed on board GOES satellites at geostationary orbit and used to examine the local time variation of magnetic field. It was found that the substorms which occurred at geostationary orbit have a strong local time dependence. In contrast to previous observations in the magnetosphere, amplitude ratios (satellite amplitude/ground amplitude) are larger than unity and can exceed unity during the daytimes during substorms. The size of the substorms tends to be very small near midnight as compared with those on the ground. Even a decrease in total force sometimes occurs in the midnight sector. It is shown that magnetic compression does not always occur in the midnight sector in the asynchronous orbit. The implication of these new characteristics is discussed in relation to associated phenomena: storm sudden commencement, magnetic field, synchronous orbit.

J. Geophys. Res., Blue, Paper 3A1591

5759 Plasma Instabilities
THE COLLISIONLESS MACROSCOPIC KELVIN-Helmholtz INSTABILITY. I. TRANSVERSE ELECTROSTATIC MODE
P.L. Pritchett and F.V. Coroniti (Physics Department, University of California, Los Angeles, Calif. 90024)
The transverse electrostatic mode in the collisionless long-wavelength Kelvin-Helmholtz instability is investigated by means of plasma simulation. The computation studied involves a sheared velocity flow perpendicular to the magnetic field. Electromagnetic particle simulations permit the determination of the linear growth rates for this mode and reveal the non-linear evolution and saturation of the instability. The linear growth rate depends on the initial conditions of the ion generation. For large values of a_1/a ($a_1/a \approx 0.5$, where a is the velocity shear scale length), there is a clear reduction in the growth rate. This reduction is due to the result of a two-fluid eigenvalue analysis with finite Larmor radius corrections. The nonlinear stage of the instability is characterized by the presence of large vortices whose size is many times the initial ion Larmor radius. At saturation the simulation is dominated by the ion cyclotron mode permitted in the system. A simple model is developed to explain these results. Implications of the results are discussed regarding the excitation of boundary instabilities at the magnetopause boundary.

J. Geophys. Res., Blue, Paper 3A1590

5760 Plasma motion
FIELD-ALIGNED CURRENTS AS A DIAGNOSTIC TOOL
A. REINHOLD, G. ALTMANN (Max-Planck-Institut für Astrophysik, Garching), Institute of Astrophysics, National Research Council of Canada, 100 Sussex Dr., Ottawa, Ontario, K1A 0R6, Canada
In the magnetosphere, currents across magnetic field lines are carried by electrons, because of their greater energy, whereas field-aligned currents are carried by protons. Consequently, there is a close enhancement of depletion of the proton current in the field-aligned direction. The field-aligned currents observed at low altitude can be used to diagnose a plasma redistribution in the outer magnetosphere, a stationary current sheet, and a convection pattern. The location and strength of field-aligned currents are used to create a model of the current system in the magnetosphere and plasma distributions in the outer magnetosphere. The model is used to predict previous models. The results are as follows: (1) A steady-state flow may exist at sub-solar latitudes. (2) The upward current sheet (Region II, aurora) is a current sheet. (3) From the tail, flux tubes convecting northward from the tail center to a dipolar shape as they connect through the earth.

(3) From the earth's flank into the plasma sheet between the region I and II currents. (Convection, field-aligned currents, magnetic field, plasma.) J. Geophys. Res., Blue, Paper 3A1590

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News

Operation Deep Sweep

Fifty scientists and a crew of 18 have embarked on a 64,000 km odyssey to explore the Pacific from pole to pole—the most ambitious program in the history of the marine geology branch of the U.S. Geological Survey (USGS). Called Operation Deep Sweep, the 1-year cruise will search areas above the Arctic Circle, off of Alaska, to McMurdo Sound in Antarctica. The 63-m, 1,300-tonne research vessel *Samuel P. Lee* sailed from its home port of Redwood City, Calif., to San Francisco to begin the first leg of the lengthy journey.

According to USGS officials and the co-sponsoring Circum-Pacific Council for Energy and Mineral Resources of the American Association of Petroleum Geologists, the cruise will ultimately involve 150 scientists, some of them representing Germany, France, Australia, and New Zealand. David Howell, branch chief of Pacific Marine Geology for the USGS, said the voyage of the *Lee* was "the most far reaching and of the longest duration" ever attempted by his unit. He said the cruise would bring together a large number of scientific experiments spanning the Pacific. Howell likened the voyage to the Lewis and Clark Expedition of 1803–1806 (which explored Louisiana and the western United States) because "we're going into unknown territory and into regions not studied except in the most cursory manner."

Cary Greene, a USGS scientist and project chief for the cruise, said Deep Sweep may give scientists their best look yet at what energy potential lies below the waters of the Pacific. "The plan," he said, "involves the *Lee* starting in the Chukchi Sea region of Alaska in late August. From there," he continued, "the ship will travel south to the Antarctic, where she will work in January and February 1984. During the trips to and from the South Pole, hydrocarbon investigations will be undertaken under the ANZUS (Australia, New Zealand, U.S.) Tripartite program for resource appraisal in the South Pacific."

During the extended voyage, the *Lee* will study coal formations in the waters around the Hawaiian Islands and do seismic studies near Hawaii, Tonga, Fiji, Vanuatu, the Solomon Islands, Papua New Guinea, and Guam before returning to Hawaii and then California. Greene said Deep Sweep has several goals to understand the logic framework of the Antarctic; to ascertain the potential for oil-Pacific strategic minerals such as cobalt, manganese, nickel, copper, lead, and barium; and to study the feasibility of thermal energy.

Circum-Pacific Council Chairman Michel T. Halbwax said, "The petroleum potential of the world is such that I believe we can find just as much oil in the future as we have found up to this point in time," he said.

"Most of it," he added, "is in offshore basins."

Halbwax is an independent Texas oilman and energy advisor to President Reagan. He pointed out that extracting oil in offshore areas is hazardous, but that "the problems are being solved every day." There was a time when drilling in 90 feet [9 m] of water was considered dangerous. Now we're producing in over 1,000 feet and drilling in more than 6,000 feet of water. I predict," he said, "that within this decade, we will be drilling in 10,000 to 15,000 feet." —PMB

Acid Rain Trends

Analyses of 10 to 15 years of water quality records for 47 headwater streams across the country suggest a decline in the acidity of precipitation in the northeastern United States and an increase in acidity in most other regions. These results, published by USGS scientists, lend a new perspective to the debate on whether increased sulfur emissions from Midwest powerplants increase the acidity of precipitation in the Northeast.

The apparent regional trends in the acidity of precipitation are expected to be reflected as changing levels of sulfate and alkalinity on streams across the country, say USGS scientists. "Because we lack long-term, nationwide data on changes in the quality of the precipitation itself, the next best possibility is to detect any changes in the quality of the receiving waters—streams and lakes—that can be attributed to changes in the acidity of the precipitation they receive," explained Richard A. Smith, USGS hydrologist and senior author of the new report. Richard B. Alexander cowrote the report.

In the same volume, R. J. Phillips and M. C. Malin describe what has been deduced about Venus's interior (pp. 150–214). "Since Venus undoubtedly has a separate core, its radial density profile is probably similar to earth's. Because of the temperature dependence of viscosity, Venus's and earth's interior temperatures should differ appreciably less than their surface temperatures do. However, the lithosphere of Venus is probably more buoyant than that of earth because of higher lithospheric temperature, and so subduction, an essential process of plate tec-

tonics, is less likely to occur. . . . We propose that the tectonics of Venus is similar to intraplate basin-and-swale tectonics on earth. Hot spot activity may be more vigorous on Venus than on earth, if seafloor spreading does not remove heat."

Venus has a very monotonous surface; the highest point is 10.8 km above the mean level, the lowest 2.9 below. Of the few distinct topographic features, Venus has a rift valley, but by comparison, the earth's Mariana Trench is 5 times deeper. Venus's "continental" masses Ioshima Terra and Aphrodite Terra are about the sizes of Australia and Africa, respectively. Venus's volcanic area, Beta Regio, is larger than the earth's Hawaii-Midway mass. Similarities are clearly not in great abundance on the surface. P. Morgan and R. J. Phillips noted recently (*Journal of Geophysical Research*, 88, 8305–8317, 1983), "Approximately 93% of the mapped topography of Venus can be explained solely on the basis of lithospheric thickness variations. . . . A hot spot crustal genesis mechanism is proposed." —PMB

Venus Space Mission

One can read about the scientific results of the Pioneer Venus exploration program in a highly valued special issue of the *Journal of Geophysical Research*, 83(A13), December 30, 1980, but these results are only a part of the impact of what has been one of the most sophisticated scientific endeavors in history. In this program numerous spacecraft—the U.S. Mariner 2, 5, 10, Pioneer 1, 2, and the Soviet Venera 4–10, 11, 12 missions—were

launched to study Venus. There were six probes to Venus's surface, one to its upper atmosphere, and three to observe its environment. Pioneer 1 is still in operation, in Venus orbit with a periapsis less than 200 km and an apogee of 66,000 km. As a result of the probes there are now diamonds and sapphires on Venus, the windows provided for spacecraft instruments to take measurements of the atmosphere, surface, and solar flux.

In the recent National Aeronautics and Space Administration's (NASA) publication

by R. O. Fimmel, L. Colin, and E. Burgess (NASA, SP-467, 253 pp., Washington, D.C., 1983), one can find out in documented detail what was known about Venus before the mission and what is known today. In this context, Hans Mark, deputy administrator of NASA, stated: "It has only been in the last few decades that the roles of Mars and Venus as 'twins' of the earth are slowly reversing as a result of observations with the Mariners, the Vikings, the Veneras and, of course, Pioneer Venus itself. Mars has turned out to be a barren desert on which it is doubtful that much ever occurred that was similar to what happened here on earth. In the case of Venus, however, the establishment of similarities between the earth and Venus has been the most important result of the recent exploration of Venus and has now led to some really tantalizing speculations."

So, Venus and earth turned out to be sister planets. Their size is nearly the same, they both have stable, dense atmospheres and probably both have had similar histories of volcanic activity. What the extensive studies of Venus have shown is that much can be learned about the interior of the planet by inference from its atmosphere and from its surface. The differences between the two planets become apparent when the space-probe results are viewed in detail.

The five chapters of this book are, ostensibly, reviews of our present understanding of space plasma interactions. The informal style referred to in the preceding paragraph has necessitated serious constraints on the presentation. The scope of the detailed presentations in most chapters is limited. Also, with the exception of Haerendel and Paschmann's chapter on the interactions between the solar wind and the magnetosphere, this volume gives principally the view of the theorist, with data presented in general to give support to the theoretical calculations first presented. Finally, the treatments are, in general, relatively personal ones, and the emphasis is on those processes that the authors think are relatively well established. The uncertainties and controversies are often deemphasized to a considerable degree. In *Origin of Magnetospheric Plasma*, Nishida devotes much space to the important successes of the magnetohydrodynamic approach in determining the way in which atmospheres can populate magnetospheres, while he makes only passing reference to observations suggesting populations by electric fields parallel to the ambient magnetic fields. Much space is devoted in Haerendel's chapter on the magnetotail, with data drawn from five lecture series presented at the Autumn College of Plasma Physics, International Center for Theoretical Physics, Trieste, Italy, October–November 1979. The audience for these lecture series was plasma and/or space plasma physicists, or students of the same, and the scope of the volume clearly reflect that condition.

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that funding of selected programs will start on or after October 1, 1984.

Inquiries and requests for the proposal information package should be addressed to Contracting Officer, USGS, Mail Stop 85, 345 Middlefield Rd., Menlo Park, CA 94025.

Correction

The October 18 issue of *EOS* (p. 597) incorrectly stated that the Joint Oceanographic Institutions (JOI), Inc., is creating a panel to coordinate scientific ocean drilling. In fact, the panel, the U.S. Science Advisory Committee (USSAC), is being formed by JOI only to coordinate efforts by members of the U.S. scientific community which relate to ocean drilling.

JOI says that it intends the new committee to complement the work of the Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES) and that it hopes USSAC will lead to wider community involvement in scientific ocean drilling and wider U.S. participation in the JOIDES planning process. Primary responsibility for directing the scientific ocean drilling program remains with JOIDES.

JOI, which wants USSAC membership to include broad representation from outside the 10 JOI member institutions, says the basic requirement for nomination is acknowledged expertise in some aspect of earth science to which ocean drilling is relevant. Particular fields include marine geology/geophysics; borehole geophysics; petrology and geochemistry; geotechnical studies; paleontology; or some other field of study requiring rock samples.

JOI is inviting nominations, including a brief vita and list of publications, to be sent by November 3 to John H. Clowes, Jr., Inc., 2100 Pennsylvania Ave., N.W., Suite 316, Washington, DC 20037.

Books

Magnetospheric Plasma Physics

Atsuhito Nishida (Ed.), D. Reidel, Boston, xi + 348 pp., 1982, \$49.50.

Reviewed by Barry H. Mauk

Magnetospheric Plasma Physics is volume 4 of an ongoing series of review books entitled *Developments in Earth and Planetary Sciences* organized by the Center for Academic Publications Japan. The series is intended to keep Japanese work; however, the present volume was written by seven internationally selected authors who have reviewed works from a broad range of sources. This volume is composed of articles drawn from five lecture series presented at the Autumn College of Plasma Physics, International Center for Theoretical Physics, Trieste, Italy, October–November 1979. The audiences for these lecture series were plasma and/or space plasma physicists, or students of the same, and the level and tone of this volume clearly reflect that condition.

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Savannah, Georgia 31416.

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North Dakota State Water Commission/Geologist. To work in aquifer evaluation and management. Bachelor's degree with two years experience in water resources and experience in quantitative techniques required. Duties include watershed modeling, tool physics and groundwater flow processes desired. Tool range \$1335-\$2278 per month. Send resume to:

North Dakota State Water Commission
Hydrology Division
100 University Hall
Bismarck, North Dakota 58503

North Dakota State Water Commission is an equal opportunity/affirmative action employer.

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Structural Geology/Tectonics, University of Michigan. The Department of Geological Sciences invites applications for a tenure-track or tenured position in structural geology (tectonics and/or clastic). Applications are open but could include any of the following: sedimentary environments, petrography, genesis, clay mineralogy, tectonics, petroleum geochemistry, stratigraphy. Our goal is to build an interactive group in sedimentary geology that presents existing strengths in microfacies/stratigraphy, geochemistry, tectonics and geophysics. Rank and salary are open to the applicant. The appointment will be with the candidate's experience. In addition to teaching responsibilities, the candidate will be expected to have completed requirements for the Ph.D. degree by that time. Faculty members are required to provide quality instruction at both undergraduate and graduate levels, and conduct research leading to scholarly publications. Successful candidates will be chosen from the following specializations:

William F. Bass
Chairman
Dept. of Earth, Atmospheric,
and Planetary Sciences
51-2916, M.I.T.
Cambridge, MA 02139

M.I.T. is an Equal Opportunity/Affirmative Action Employer.

The University of Texas at Dallas/Sedimentary Geology. The Geosciences Program at the University of Texas at Dallas is seeking two dynamic individuals for tenure-track positions in the general field of sedimentary geology (clastic and/or clastic). Applications are open but could include any of the following: sedimentary environments, petrography, genesis, clay mineralogy, tectonics, petroleum geochemistry, stratigraphy, tectonics and geophysics. Rank and salary are open to the applicant. The appointment will be with the candidate's experience. In addition to teaching responsibilities, the candidate will be expected to have completed requirements for the Ph.D. degree by that time. Faculty members are required to provide quality instruction at both undergraduate and graduate levels, and conduct research leading to scholarly publications. Successful candidates will be chosen from the following specializations:

Exploration Geophysics
Solid-Earth Geophysics
Hydrogeology
Analytical Structural Geology
Chair, Sedimentary Geology
Applications should send resume, transcripts, and names and addresses of three references to:

Ton Freeman, Chairman
Department of Geology
University of Missouri
Columbia, MO 65211

The City College of the City University of New York is an equal opportunity affirmative action employer.

The University of Illinois/University of Urbana-Champaign. The Department of Geology has re-instituted its search for a hydrologist to fill a permanent, tenure-track faculty position. The appointment will be at the assistant or associate level. The individual must have a strong background in a topic in hydrogeology and computer applications. In addition, the individual should have an interest in atmospheric chemistry or pollution as applied to urban areas, physical oceanography, and possibly environmental geochemistry. The person hired will be required to teach courses in hydrogeology, and possibly physical oceanography, and to participate in a graduate research program. Participation in the G.U.N.Y. Ph.D. Program in Earth and Environmental Sciences is anticipated. Rank and salary will be commensurate with experience. Send resume, transcripts and three letters of reference by November 30, 1983 to Professor Dennis Webb, Chairman, Department of Earth and Planetary Sciences, The City College, 138 Street and Convent Avenue, New York, NY 10031. The deadline for applications is January 15, 1984. This position is contingent on funding approval.

The University of Illinois is an equal opportunity/affirmative action institution.

Graduate Teaching and Research Assistantships in Marine Environmental Sciences and Coastal Geodynamics. Opportunities for graduate study with emphasis on teaching and research assistantships are available for students interested in the M.S. program in Marine Environmental Sciences and the Ph.D. program in Coastal Oceanography. Awards cover tuition and academic year stipend up to \$7,250. Additional awards available for students to \$10,000. Graduate Research Programs Chairwoman, Marine Science Research Center, State University of New York, Stony Brook, N.Y. 11794.

State University of New York does not discriminate on the basis of race, sex, religion, national origin, age, physical disability or marital status, in admissions, hiring, and treatment of either students or employees.

The University of Illinois is an affirmative action/equal opportunity employer.

Meeting Report

Meetings

Solar-Terrestrial Physics Workshop

A workshop spanning the entire field of solar-terrestrial physics and emphasizing the comparison of theory with experiment was held June 6-10, 1983. The purpose of the workshop was to focus attention on current knowledge; force debate of outstanding questions; and encourage interaction among the theory, data-analysis, and laboratory-simulation segments of the community.

Reports drafted at the meeting will form the basis for the overall workshop document, to be available this winter; the publication is intended as a benchmark and a resource document of our understanding of solar-terrestrial physics.

The workshop was jointly sponsored by the National Science Foundation and the National Aeronautics and Space Administration. It was overseen by a steering committee composed of Dennis Papadopoulos, chairman, Jay Boris, Ed Szwedziewicz, Don Williams, Mukul Kundu, and Dixon Butler. The steering committee selected the invitees and assigned them to different groups. About a dozen younger scientists at the senior graduate and junior post-doctoral level were invited in order to be presented with an overall picture of the research field they selected.

There was a general consensus that the meeting, which included informal working-group discussions and plenary sessions, had been beneficial; although the process had required much hard work. Plans for another workshop along these lines 3 or 4 years hence were being considered.

This meeting report was prepared by Dixon Butler, who is with the National Aeronautics and Space Administration, Washington, DC 20546.

And Dennis Papadopoulos, who is with the University of Maryland, College Park, MD 20742.

Meetings (cont. on p. 622)

Chairman, Department of Oceanography/Old Dominion University. Due to an internal promotion of the former Chairman, the Dept. of Oceanography is now seeking a Chair. Applications are invited from persons with an earned doctorate, teaching experience, and a record of quality research and publication in oceanography. Some administrative experience is desirable but not mandatory. Old Dominion University is a state-supported university. Some undergraduate service courses are also offered. The departmental emphasis is on graduate teaching and research. The department is at present 15 faculty and 70 students. This position is staff supported and will be available by August 1984. Salary range \$21,000-\$30,000. Send resume, three letters of reference, and a statement of research interests to Dr. L. Z. Loh, Chairman, Department of Oceanography, Old Dominion University, Norfolk, Virginia 23508.

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The University of California, San Diego/Postgraduate Researcher. Scripta Institution of Oceanography invites applications for a postgraduate research assistantship (Postgraduate Researcher). The postgraduate researcher will be responsible for research projects in marine geochemistry or geochemistry or marine geochronology, or marine geobiology. Some administrative experience is desirable but not mandatory. Old Dominion University is a state-supported university. Some undergraduate service courses are also offered. The departmental emphasis is on graduate teaching and research. The department is at present 15 faculty and 70 students. This position is staff supported and will be available by August 1984. Salary range \$21,000-\$30,000. Send resume, three letters of reference, and a statement of research interests to Dr. L. Z. Loh, Chairman, Department of Oceanography, Old Dominion University, Norfolk, Virginia 23508.

Old Dominion University is an affirmative action/equal opportunity employer.

National Center for Atmospheric Research/Visitor Appointee. The Geosciences Program at the University of Texas at Dallas/Sedimentary Geology invites applications for a tenure-track position in sedimentary geology (carbonate and/or clastic) to begin September 1984. Areas of specialization are open and could include any of the following: sedimentary facies, paleogeography, tectonics, clay mineralogy, tectonics, petrography, geomorphic stratigraphy. Our goal is to build an interactive group in sedimentary geology that presents existing strengths in microfacies/stratigraphy, geochemistry, tectonics and geophysics. Rank and salary are open to the applicant. Duties will involve advanced undergraduate and graduate courses in the area of sedimentary geology, engineering, mathematics, or computer sciences. Hardware background should include IBM, DEC, CYBER or HP-1000 equipment. Send resume in confidence to:

Research and Data Systems, Inc.
10300 Greenbelt Road, Suite 200
Lanham, Maryland 20706
Telephone: (301) 390-6100

NCAR is an Equal Opportunity/Affirmative Action Employer.

National Center for Atmospheric Research/Visitor Appointee. At the High Altitude Observatory, NCAR, Applications are invited for one to two year periods to carry out research in solar physics, solar-terrestrial physics, and related subjects. Applicants should provide a curriculum vitae including education, work experience, publications, the names of three scientists familiar with their work, and a statement of

Meetings (cont. from p.62)**Announcements****Hydrology at AGU Fall Meeting****Modeling Aquifer Management**

As part of a symposium on Optimization Techniques for Managing Groundwater and Stream-Aquifer Systems, there will be a panel discussion entitled "The Role of Simulation-Optimization Modeling in Aquifer Management." The symposium will be held on Thursday, December 8, 8:30-11:30 A.M., and the panel discussion will run from 11:30 A.M. to 12:15 P.M. The chairman of the session will be Manouch Heidari, Kansas Geological Survey.

Discussion will focus on issues such as: Can groundwater resources be efficiently managed? Are simulation-optimal models useful in the management of physically, economically, and legally complex aquifer systems? How can management modeling results be implemented? What elements of real systems have not been incorporated in these models? What should be the future direction of management modeling research? The panel members will be John D. Bedient, Nathan Buras, Yacov Y. Haines, Thomas Madole III, Gerald T. O'Mara, and Robert Willis.

Flood Risk and Streamflow

As a result of AGU's surface runoff committee's activities, several sessions at the 1983 AGU Fall Meeting will focus upon flood risk assessment, using statistical techniques and physically-based models, and also multivariate stochastic streamflow models. Of special importance are the two special sessions on Friday addressing recent flood-frequency research. The morning session on Statistical Procedures for Estimation of Flood Risk at Gaged Sites was organized by J. Stedinger. It contains papers by K. Putter, D. Hershfield, D. Wall, C. Marin, D. Leitnermaier, D. Newton, and J. Herrin; W. Thomas, and L. Beard.

On Friday afternoon, a special session organized by J. Valdez will address Searching for More Physically-Based Extreme Value Distributions. Papers will be presented by P. Todorovic, V. Gupta, M. Kavvas, R. Bras, and C. Hebborn. In addition, another 10 papers presenting flood-frequency research will be presented in a general hydrology session on Wednesday afternoon after the hydrology session luncheon. Topics to be discussed in the three sessions include flood measurement error, regionalization procedures, empirical Bayes analysis, WRC's Bulletin 17, use of historical flood information, scale and similarity, and derived distributions for ungaged catchments. The Friday sessions will close with a review, by J. Schlueter, V. Klemes, and M. Moss, of recent accomplishments and research needs. Individuals interested in flood frequency analysis shouldn't miss this unique event.

Another special session will be on Thursday on Multivariate Modeling of Hydrologic and Other Geophysical Time Series, organized by J. Salas. D. Brillinger will give a keynote address. D. Valencia, J. Stedinger, V. Yevjevich, S. Camacho, I. Macneill, W. Lane, R. Hirsch, and D. Woolhiser, will present invited papers in the morning. Other papers will be given in the afternoon meeting and in the general hydrology session on Wednesday. The Thursday afternoon meeting will close with a discussion led by a panel consisting of M. Fiering, S. Burges, A. Robinson, and D. Shear.

Plan To Attend

The AGU Chapman Conference on Natural Variations in Carbon Dioxide and the Carbon Cycle
Convenors: E. T. Sundquist and W. S. Broecker
January 9-13, 1983
Innisbrook
Tarpon Springs, Florida

Natural Variations in Carbon Dioxide and the Carbon Cycle will bring together geologists who are studying various aspects of carbon cycle history; geochemical modelers; and biologists, oceanographers, and meteorologists who are familiar with present and potential future relationships among the carbon cycle, atmospheric CO₂ and climate.

Questions to be discussed at this conference are: What caused the carbon cycle variations? How were they related to atmospheric CO₂? Were they associated with climate changes consistent with the CO₂ climate predictive models? What are the long-term geochemical implications of fossil fuel CO₂?

There will be sessions devoted to overviews by experts on the application of ocean modeling, climate modeling, and the biosphere modeling to CO₂ as well as sessions emphasizing the geological record.

The meeting will be organized around six time slices: the last 2,000 years, the last 20,000 years, the last 2 million years, the Cenozoic, the Phanerozoic, and the Precambrian. Don't miss this exciting program!

Registration and housing information will be available by November 30. To be placed on a mailing list write: CO₂ Meeting, 2000 Florida Avenue, N.W., Washington, DC 20009 (202) 462-6903.

For program information contact: E. T. Sundquist, U.S. Geological Survey, 431 National Center, Reston, VA 22092 (703) 660-6083.

Groundwater Instrumentation

The National Water Well Association (NWWA) will hold the Second National Symposium and Exposition on Groundwater Instrumentation in Las Vegas, Nev., April 2-4, 1984. Abstracts of papers for presentation at the meeting are due November 25.

NWWA invites soil scientists, hydrogeologists, hydrologists, engineers, and others working with instruments designed to study groundwater systems to attend and share research results. Paper topics include groundwater sampling devices and quality measuring devices; vadose zone measuring devices; devices for measuring water level; surface and borehole geophysical instruments; computer devices, data acquisition, and telemetry equipment; and contaminant detection and cleanup equipment.

Abstracts of 300 words or fewer should be sent along with a biographical sketch (no longer than 100 words) of each author, full mailing address, and phone number. For more information, contact David M. Nielsen, Conference Coordinator, NWWA, 500 W. Wilson Bridge Rd., Worthington, OH 43085 (telephone: 614-846-9335).

Eurogeophysics

The European Geophysical Society (EGS) will hold the Eurogeophysics Assembly July 29-August 4, 1984, at Louvain-la-Neuve, Belgium, with open sessions on external geophysics and geophysical fluid dynamics.

Symposium and workshop topics will include future planetary missions; structure of pre-Alpine orogenies; long-lived eddies in oceans and atmospheres; models of oceanographic mesoscale phenomena; magnetohydrodynamic effects of seismic activity; first results of European geophysics and solar experiments on Spacelab; convection phenomena in geophysics; geophysical, petrological, and structural aspects of large-scale tectonic phenomena; paleomagnetism; age dating; and sedimentology of young sediments; motions and physical processes in atmospheres and hydrospheres as revealed by remote sensing techniques; and aspects of climate.

For information, contact EGS General Secretary M. Brown, Dept. of Physics, University College of Wales, Aberystwyth, Wales, UK.

Marine 3-D Data

December 15 is the deadline for submitting abstracts to the 4th Biennial Society of Exploration Geophysicists/U.S. Navy (SEG/USN) Joint Technical Symposium on Three-Dimensional Marine Data Collection, Processing, Interpretation, and Presentation. The symposium, sponsored by SEG and the Office of Naval Research, will be held March 15-18, 1984, at the National Space Technology Laboratories in Bay St. Louis, Miss. (J. A. Ballard, Chairman, NORDA, NSTL, MS 39529; tel: 601-488-4700).

April 29-May 4, 1984 Penrose Conference on Processes and Products of Multibeam Melting and Metamorphism in the Mantle. W. Scott Baldwin, Los Alamos National Laboratory, Mail Stop 1978, P.O. Box 1619, Los Alamos, NM 87545, or Pat Wood Dickeron, Gulf Oil International, P.O. Box 36506, Houston, TX 77236.

**Section Candidates****Statement**

"Oceanographers educational backgrounds are very diverse, representing the broad range of science. Yet there is the common interest in the ocean that ties us together into a 'community.' The Ocean Sciences section of AGU provides this group with its only national, and, through interaction with other groups, international professional organization. The Section, through its meetings, and by its Oceanography Report appearing in *EOS*, allows frequent exchange of ideas, research plans and results, as well as discussion of various professional concerns we might have. I will encourage, and whenever possible, enhance this vital role by recognizing current and future problems and opportunities. By acting as facilitator for exchange of ideas, I hope to enable the membership of the Section to meet these new developments and challenges from a position of knowledge and strength."

"While my term as *EOS* Editor for the Oceanography Report ends in 1984, I will continue efforts to make it the focal point for continued efforts to make it the focal point for physical, chemical, geological, and biological oceanographers."

"As the study of the ocean becomes more complex and global, and continued progress is dependent on rather sophisticated and expensive facilities with more stress on research group concepts, there is an increasing need for an active professional society, such as our Ocean Sciences Section of AGU. The Section can aid not only in the organization of the required resources, but also ensure that the creative individual, so important to our development, is not lost to the impending big scene."

Donald V. Hansen A member of AGU since 1963; 52 years old. Professor of Oceanography at Columbia University at the Lamont-Doherty Geological Observatory, Palisades, New York. Major research interest is physical oceanography, particularly in regard to climate relevance of ocean circulation and mixing. B.A., Hunter College, 1961; Ph.D., Columbia University, 1965, with employment at Lamont-Doherty Geological Observatory to the present. Membership in AAS, AGU, AMS and Sigma XI; 77 publications, 18 in AGU publications; many dealing with the Southern Ocean circulation and winter mass formation. Editor of 3 volumes. Recipient of the U.S. Antarctic Service Medal. Participation in many review panels; national and international committees. Associate Editor of *JGR* (1978-1979); and since 1981, Editor of *EOS*, overseeing the Oceanography Report. A monthly *EOS* feature dedicated to the Oceanography AGU section.

AGU FALL MEETING

December 5-9, 1983
San Francisco, California



Housing: Reservations will be accepted on a space availability basis **only**.

Send your housing form directly to the Housing Coordinator, AGU Fall Meeting, S.F. Housing Bureau, P.O. Box 5612, San Francisco, CA 94101.

Preregistration Deadline: November 10

There is still time to preregister. Save time and money! Send your registration form to the AGU Fall Meeting, 2000 Florida Ave., N.W., Washington, DC 20009.

Make your Airline Reservation: Call United

Dial the United toll free number 800-521-4041 (in Michigan, 800-482-0243). Give United your AGU Convention Number—4367—to ensure that you receive the AGU Discount Air Fare.

Registration and housing forms, the program summary, and airline information were published in *EOS*, October 18, 1983. For additional information, contact the AGU Meetings Department at 202-462-6903.

and as a science teacher with Seattle Public Schools. Following graduate education held a position as Research Assistant Professor at the University of Washington before accepting a position as Research Oceanographer with the U.S. Department of Commerce. Has been director of the Physical Oceanography Laboratory, Atlantic Oceanographic and Meteorological Laboratories (AOML) since 1969, and additionally was Acting Director, AOML during 1978-1980. A member also of Sigma Xi, ASLO, AAAS, Florida Academy of Science, and International Oceanographic Foundation, and holds an appointment as Adjunct Professor at the University of Miami. Over 44 publications in oceanography, 3 of which appeared in AGU journals; numerous presentations and chairmen of scientific sessions at the AGU meetings. Has published results of research on equatorial circulation, tides, the Gulf Stream system, and continental shelf circulation. Has also published on the Gulf of Alaska and Beaufort Sea, and presently is working on circulation in the tropical Pacific Ocean. Received NOAA awards for distinguished scientific authorship in 1971, 1975, 1977, and 1980, and other NOAA awards. Served as Associate Editor, *Journal of Geophysical Research*, during 1966-1968, and has served on several special panels for AGU, NAS, and other organizations.

not been particularly successful about communicating the excitement and importance of much of our research to people outside our discipline. The interest attached to the El Niño event of the past year is something of a exception, but even here we have been outpaced by the atmospheric scientists. Efforts to develop the general interest in our work can help in ease some of our most critical concerns, such as funding for research, and recruitment, especially from the minority groups historically underrepresented in oceanography."

Ocean Sciences: Secretary

Barbara M. Hickey

A member of AGU since 1974; 37 years old. Research Associate Professor, University of Washington. Major interests: coastal and equatorial circulation, B.S.C. in mathematics and physics, University of Toronto, 1967; M.S. (1969) and Ph.D. (1975) in oceanography, Scripps Institution of Oceanography, University of California, San Diego. Research Assistant Professor, 1974-1980, University of Washington. Research Associate Professor since 1980. 12 refereed publications, 4 published by AGU. Oceanography Chairman for 1982 AGU Fall Meeting.

Statement

"The principal function of each section of AGU is to strengthen the field by promoting communications among the membership, and between the membership and lay persons. It appears to me that as a result of the scientific journals sponsored by the Union, topical features such as the Oceanography Report in *EOS*, and the several special interest newsletters in more or less regular circulation, communication among the membership, and even the nonmembers associated with the traditional research institutions, is good. Furthermore, although like all other organizations we must continue vigilance with respect to maintaining membership, the present level of section affiliation by professionals associated with established research institutions also is gratifying.

"There are however at least two areas in which special efforts are merited. The first of these is to ensure the participation of new professionals becoming associated with the latest growing segment of oceanography, the numerous large and small companies established to address environmental, developmental, and other aspects of applied oceanography. This cadre of commercial professionals is likely to become a major segment of our discipline in the future. It is vital that it be kept in communication with the more traditional part of the discipline.

"Another point of communications that can bear improvement is that between ocean sciences and the general public. We have most-

Membership Applications Received

Applications for membership have been received from the following individuals. The letter after the name denotes the proposed primary section affiliation.

Riad Al-Dabbagh (H), John M. Farr (H), Paul C. Fieller (O), A. Russell Flegal (O), Nelson G. S. Freeman (O), Phyllis S. Greifinger (SM), Terry D. Kelly (SA), Alfred Kracher (P), David London (V), Stanley A. Merittman (V), Masao Minagawa (V), Asumi Okumura (M), Robert A. Olson (S), Gerald T. O'Mara (H), William A. Robertson (GP), Guillermo Rodriguez (T), Derek Peter Smit (SM), Jack T. Stegman (SA).

Student Status

Robin E. Bell (T), Greg N. Bojorquez (T), John A. Chulick (S), Kathleen Ann Devaney (V), Louis H. Estey (S), Sue A. Ferguson (M), Eric J. Fielding (T), Michael Folio (T), Ali Mohammadi Ghazi (V), Keith A. Goetz (SS), Francis P. Kelly (O), Bruce T. Marshall (H), Frederic Matthei (S), Marcia Nelson (P), Peng Fang (G).

Five Members

Kevin Burke, John A. Draper, Kazuya Fujita, Robert B. Smith.

Four Members Ernest J. Breeding Jr., Laurie Brown, Robert L. Dubois, John E. Ebel, John J. Gallagher Jr., Louis J. Gordon, C. G. A. Harrison, Dennis S. Horlitz, Ivan A. Johnson, L. A. Kivimaki, John T. Kuo, Brian J. Mitchell, Larry J. Ruff, Charles G. Sammis, Edward Seeger, William J. Teague, Gordon M. Wolman.

Three Members Thomas J. Ahrens, Orion L. Anderson, Randall J. Charlenneau, Richard G. Gordon, Richard L. Hawkins, George M. Hornberger, John F. Hubbard, Peter K. Kiambris, John N. Ludden, William Berry Lyons, Maurice W. Major, James S. McLean, Harlan L. McKinn, David F. McNamee, Philip J. McNamee, Dennis O. Nelson, Robert M. Ragan, John H. Reynolds, Dietrich H. Roeder, Michael Schulz, Leslie Smith, Uriel A. Ustila, Francis T. Wu, David A. Yuen.

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Aeronomy

DATA OBSERVATION AND SCATTERING OF RADIONUCLIDES BY STRATOSPHERIC SATELLITES. J. R. BROWN (University College, London, England), J. R. HARRIS (University of East Anglia, Norwich, England). Includes a brief description of the NORPAN project, the NORPAN experimental plan, and the NORPAN data processing system.

SEPARATION OF NOISE FROM SIGNAL IN ATMOSPHERIC DATA BY LINEAR STATISTICAL FILTERING. This filtering process can be viewed as weighted averaging with coefficients chosen to enhance the statistical properties of the average sufficiently understood. Linear statistical filtering is an effective tool for data enhancement. The noise reduction and signal recovery are well understood when the noise and signal occupy the same window, linear or square averaging performs poorly. A signal enhancement procedure is also described to extract the desired information. As a nonlinear operation which is statistically similar to averaging, median filtering represents one possible alternative. The paper discusses the application of median filtering to several satellite data enhancement problems.

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